Fitzgerald et al.
Application No.: 09/381,497
Page 2

PATENT

This amendment is accompanied by a floppy disk containing the above named sequences, SEQ ID NOS:1-15, in computer readable form, and a paper copy of the sequence information which has been printed from the floppy disk.

The information contained in the computer readable disk was prepared through the use of the software program "PatentIn" and is identical to that of the paper copy.

IN THE CLAIMS:

Please add new claims 40-49 and cancel claims 18-21 and 33-39 without prejudice to revival for subsequent prosecution. Please amend claims 1, 5-8, 11, 12,15, 22, and 27-30 and substitute the following amended, clean version of all pending claims as follows. A marked up copy of the amendments to the claims is attached as Appendix A.

1.   (amended) A recombinant immunoconjugate, comprising a therapeutic agent or a detectable label covalently linked to a recombinant antibody that binds an extracellular epitope of CD22 (an "anti-CD22 antibody") having a V_H with a cysteine at amino acid position 44 and a V_L with a cysteine at amino acid position 100.

2.   (as filed) The recombinant immunoconjugate of claim 1, wherein said therapeutic agent is a toxin.

3.   (as filed) The recombinant immunoconjugate of claim 2, wherein said toxin is a *Pseudomonas* exotoxin (PE) or a cytotoxic fragment thereof.

4.   (as filed) The recombinant immunoconjugate of claim 3, wherein said cytotoxic fragment is PE38.

5.   (amended) The recombinant immunoconjugate of claim 1, wherein said anti-CD22 antibody is a binding fragment that binds a same epitope as an RFB4 disulfide-stabilized Fv (dsFv) comprising a variable heavy (V_H) chain as set out in SEQ ID NO:2, wherein a Cys residue is substituted for Arg at position 44; and a variable light (V_L) chain as set out in SEQ ID NO:4, wherein a Cys residue is substituted for Gly at position 100.

6.   (amended) The recombinant immunoconjugate of claim 1, wherein said antibody comprises a variable heavy (V_H) chain at least 90% identical to that set out in SEQ ID

Fitzgerald et al.
Application No.: 09/381,497
Page 3

PATENT

NO:2 over a comparison window of 10 amino acids, and a variable light (V_L) chain at least 90% identical to that set out in SEQ ID NO:4 over a comparison window of 10 amino acids; and further, wherein said antibody binds to the same epitope as an RFB4 antibody comprising a V_H chain of SEQ ID NO:2 and a V_L chain of SEQ ID NO:4.

7. (amended) The recombinant immunoconjugate of claim 3, wherein said variable heavy (V_H) chain is covalently linked to the carboxyl terminus of said toxin.

8. (amended) The recombinant immunoconjugate of claim 6, wherein said V_H chain is covalently linked to said V_L chain through a linker peptide.

9. (as filed) The recombinant immunoconjugate of claim 6, wherein said V_H chain is linked to said V_L chain through a cysteine-cysteine disulfide bond.

10. (as filed) The recombinant immunoconjugate of claim 8, wherein said linker peptide has the sequence of SEQ ID NO:5.

11. (amended) An expression cassette encoding a recombinant immunoconjugate comprising a sequence encoding for a toxin peptide and an antibody that binds to an extracellular epitope of CD22 (an "anti-CD22" antibody) having a V_H encoding for a cysteine at amino acid position 44 and a V_L encoding for a cysteine at amino acid position 100.

12. (amended) The expression cassette of claim 11, wherein said antibody is a binding fragment that binds to a same epitope as an RFB4 disulfide-stabilized Fv (dsFv) comprising a variable heavy (V_H) chain as set out in SEQ ID NO:2, wherein a Cys residue is substituted for Arg at position 44; and a variable light (V_L) chain as set out in SEQ ID NO:4, wherein a Cys residue is substituted for Gly at position 100.

13. (as filed) The expression cassette of claim 11, wherein said toxin is a *Pseudomonas* exotoxin (PE) or a cytotoxic fragment thereof.

14. (as filed) The expression cassette of claim 11, wherein said cytotoxic fragment is PE38.

Fitzgerald et al.
Application No.: 09/381,497
Page 4

PATENT

15.   (amended) The expression cassette of claim 11, wherein said antibody comprises a variable heavy (V_H) chain at least 90% identical to that set out in SEQ ID NO:2 over a comparison window of 10 amino acids, and a variable light (V_L) chain at least 90% identical to that set out in SEQ ID NO:4 over a comparison window of 10 amino acids; and further, wherein said antibody binds to the same epitope as an RFB4 dsFV as set out in claim 12.

16.   (as filed) The expression cassette of claim 15, further comprising a sequence encoding for a linker peptide having the sequence of SEQ ID NO:5.

17.   (as filed) A host cell comprising an expression cassette of claim 11.

22.   (amended) A method for inhibiting the growth of a malignant B-cell that expresses a CD22 molecule on the surface of the cell, said method comprising:

contacting said malignant B-cell with an effective amount of a recombinant immunoconjugate of claim 1, thereby inhibiting the growth of the malignant B-cell.

23.   (as filed) The method of claim 22, wherein said toxin is a *Pseudomonas* exotoxin (PE) or a cytotoxic fragment thereof.

24.   (as filed) The method of claim 22, wherein said malignant B-cell is contacted *in vivo*.

25.   (as filed) The method of claim 22, wherein said malignant B-cell is selected from the group consisting of: a rodent B-cell, a canine B-cell, and a primate B-cell.

26.   (as filed) The method of claim 23, wherein said cytotoxic fragment is a PE38 fragment.

27.   (amended) The method of claim 22, wherein said immunoconjugate comprises an antibody binding fragment that binds to a same epitope as an RFB4 disulfide-stabilized Fv (dsFv) comprising a variable heavy (V_H) chain as set out in SEQ ID NO:2, wherein a Cys residue is substituted for Arg at position 44; and a variable light (V_L) chain as set out in SEQ ID NO:4, wherein a Cys residue is substituted for Gly at position 100.

Fitzgerald et al.
Application No.: 09/381,497
Page 5

PATENT

28.   (amended) The method of claim 22, wherein said immunoconjugate comprises an antibody comprising a variable heavy (V_H) chain at least 90% identical to that set out in SEQ ID NO:2 over a comparison window of 10 amino acids, and a variable light (V_L) chain at least 90% identical to that set out in SEQ ID NO:4 over a comparison window of 10 amino acids; and further, wherein said antibody binds to the same epitope as an RFB4 antibody comprising a V_H chain of SEQ ID NO:2 and a V_L chain of SEQ ID NO:4.

29.   (amended) The method of claim 23, wherein a variable heavy chain is covalently linked at the carboxyl terminus of said toxin.

30.   (amended) The method of claim 29, wherein said V_H chain is covalently linked to said V_L chain through a linker peptide.

31.   (as filed) The method of claim 29, wherein said V_H chain is linked to said V_L chain through a cysteine-cysteine disulfide bond.

32.   (as filed) The method of claim 31, wherein said linker peptide has the sequence of SEQ ID NO:5.

40.   (new) An isolated nucleic acid encoding a V_H chain comprising an amino acid sequence as set out in SEQ ID NO:2.

41.   (new) An isolated nucleic acid encoding a V_L chain comprising an amino acid sequence as set out in SEQ ID NO:4.

42.   (new) An isolated nucleic acid encoding a V_H chain comprising a conservatively modified variant of an amino acid sequence set forth in SEQ ID NO:2.

43.   (new) An isolated nucleic acid encoding a V_L chain comprising a conservatively modified variant of an amino acid sequence set forth in SEQ ID NO:4.

44.   (new) An antibody that binds to an extracellular epitope of CD22 (an "anti-CD22 antibody") comprising a variable heavy (V_H) chain that is a conservatively modified variant of SEQ ID NO:2 and a variable light (V_L) chain that is a conservatively modified variant of SEQ ID